

Email from Dr. Gary Kayajanian  
To Tom Miller

Date: 02 13 2006 03:45 PM

This is a formal request to participate in the 2/23- and 2/28/06 SAB Arsenic Teleconference, to include an opportunity to speak on low-dose hormesis on 2/28/06. I did not notice a telephone number for the call-in. I assume it is the old number: 866-299-3188, with the standard conference code -- correct me if I am wrong. My brief note, presented as an attachment, puts in writing what I would say on the 28th.

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## HORMESIS AND INORGANIC ARSENIC: FURTHER COMMENTS ON THE SAB DRAFT DOCUMENT

Gary Kayajanian

In its discussion of hormesis, the SAB panel has failed to notice the low exposure cancer data from the Taiwan and (Millard County) Utah data sets, which I have cited in earlier submissions. The low arsenic exposure I am describing is villages with 10 to 60 ppb in Taiwan and 0 to <75 ppb in the Utah population. In each data set there is a significant increase in the cancer mortality rate in the lower segment of the arsenic exposure range (10 to 32 ppb in Taiwan and 0 to <25 ppb in Utah) compared to the higher segment of the range. While these data may be new to some members of the SAB panel, the Taiwan data and its analysis and the Utah analysis have been published in the refereed literature, [Kayajanian, G., (2003) *Ecotoxicology and Environmental Safety* 55, 139-142], as well as in several sets of comments to the SAB in connection with this current review.

The cancer reductions observed with hormesis are cancers that would otherwise be caused by other agents, not the arsenic. So, one would not observe hormesis if there were no (other) carcinogens in the environment. Those non human studies presented to the SAB Panel by the Agency would fail to capture the hormetic effect (at any dose), because they operate in the vacuum of a non cancer background.

Anyway, at the low arsenic exposures of interest to the regulatory arm of the EPA, the hormetic effect dominates any carcinogenic effect otherwise attributable to inorganic arsenic. In practical terms then, at modest exposures around 50 ppb, arsenic is a potent anti-carcinogen. Lowering the exposure level to 10 ppb or below would be calculated to cause a significant increase in the cancer (and from the Utah data set where it was reported on, the heart disease) mortality rate.